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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,148	09/25/2001	Stephen C. Hahn	SUN-P6407-PIP	1747

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EXAMINER	
BULLOCK JR, LEWIS ALEXANDER	
ART UNIT	**PAPER NUMBER**
2195	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/964,148	HAHN ET AL.	
	Examiner	Art Unit	
	Lewis A. Bullock, Jr.	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-8,10,12,13,15,17-19,21,23,24,26,28-30 and 32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-8,10,12,13,15,17-19,21,23,24,26,28-30 and 32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 6-8, 10, 12, 13, 15, 17-19, 21, 23, 24, 26, 28-30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over BRENNER (U.S. Patent 6,859,926).

As to claim 1, BRENNER teaches a method for allocating computer system resources (system resource) between concurrently executing workloads, comprising: establishing a first resource pool (class) that specifies resources (system resources), wherein the plurality of different computer system resources are components of a single computer system, wherein the computer system resources include central processing units (CPU time), and at least one of memory (shares of memory), swap space, network interfaces, and scheduling classes (col. 5, line 61 – col. 6, line 3; col. 6, lines 12-16), and wherein establishing the first resource pool involves establishing minimum size (minimum amount) and maximum size requirements (maximum amount) for a given resource that can be assigned to the first resource pool (col. 6, lines 12-16); allocating the plurality of different computer system resources (resources) to one or more resource pools (classes), including the first resource pool, to create resource allocation (associated number of system resources to each class) (col.

5, line 61 – col. 6, line 3), wherein requirements of the first resource pool (max amount / min amount) are satisfied (via calculating the percentage goal and allocating accordingly) (col. 7, line 64 – col. 8, line 15; col. 8, lines 38-65), and wherein the resources are assigned to the first resource pool (higher priority class gets its resources) wherein prior to allocating the plurality of different computer system resources (allocation of additional resources), the method comprises: verifying that collective requirements of the one or more resource pools can be satisfied (via calculating the percentage goal and adjusting the priority allocation indication accordingly such that additional resources are allocated based on priority) (col. 7, line 64 – col. 8, line 15; col. 8, lines 38-65; col. 9, lines 18-24; col. 10, lines 10-25); and if the collective requirements cannot be satisfied, signaling a condition (via overcommiting the resources and signaling an orange range condition) (col. 11, line 56 – col. 12, line 5); and wherein resources (resources) allocated to the first resource pool (class) can change over time (via the allocation of additional resources) (col. 7, line 64 – col. 8, line 15; col. 8, lines 38-65; col. 9, lines 18-24; col. 10, lines 10-25; col. 6, lines 24-32); binding a first process (process) to the first resource pool (class) (col. 5, lines 26-38), so that the first process has access to the plurality of different computer system resources allocated to the first resource pool (col. 7, line 64 – col. 8, line 15; col. 8, lines 38-65; col. 9, lines 18-24; col. 10, lines 10-25); and storing a representation of the resource allocation to non-volatile storage (via storing the resource max/min limits for each class in a share/tier profile storage device) (col. 5, lines 16-25; col. 5, lines 33-36; col. 8, lines 57-65; col. 14, lines 5-8) so that the

resource allocation can be reused after a machine failure (via retrieving the resource max/min limits for each class from a share/tier profile storage device) (col. 5, lines 16-25; col. 5, lines 33-36; col. 8, lines 57-65; col. 14, lines 5-8). BRENNER teaches setting a condition if the resource requirements are not satisfied, i.e. limits / percentage goal exceeds their limits by overcommiting resources and that any type of system resource may be represented using the present invention including hardware and software resources (col. 6, lines 1-3). It is well known in the art that multiple types of scheduling algorithms are well known software resources and therefore obvious based on the teachings of Brenner that the scheduling algorithms **can** be allocated to resource pools since the teachings of Brenner includes all hardware and software resources. However, BRENNER does not explicitly state that this condition is an error condition. The claim language provides no details as to what constitutes an error condition or how it is handled. It would be obvious to one of ordinary skilled in the art at the time of the invention that the overcommiting setting condition of signaling an orange range condition would constitute an error condition and therefore would be obvious in view of BRENNER that the handling of the orange condition does not allocating additional resources to the class.

As to claim 2, BRENNER teaches allocating the plurality of different computer system resources (resources) to one or more resource pools (classes) involves: partitioning each of the plurality of different computer system resources (resources) into one or more partitions (classes), wherein a first partition is

associated with a first resource (resource) and a second partition is associated with a second resource (resource); allocating the first partition to a single resource pool (tier), so that only processes associated with the single resource pool can access the first partition; and allocating the second partition to multiple resource pool (tier) so that processes associated with the multiple resources pools can share the second partition (col. 11, lines 16-32; col. 7, line 64 – col. 8, line 15; col. 8, lines 38-65; col. 9, lines 18-24; col. 10, lines 10-25; col. 6, lines 24-32).

As to claim 4, BRENNER teaches establishing the first resource pool involves selecting a representation of the first resource pool from a plurality of possible files (via retrieving the resource max/min limits for each class from a share/tier profile storage device) (col. 5, lines 16-25; col. 5, lines 33-36; col. 8, lines 57-65; col. 14, lines 5-8). Official Notice is taken in that file systems are well known storage devices and therefore it would be obvious to one skilled in the art at the time of the invention that a file is selected and retrieved from the storage device that represents the resource max/min limits for each class in order to acquire the values.

As to claim 6, BRENNER teaches storing the representation of the resource allocation involves storing a representation of each of the one or more resource pools (classes) along with associated resources (via storing the resource max/min limits of each resource for each class to a share/tier profile

storage device) (col. 5, lines 16-25; col. 5, lines 33-36; col. 8, lines 57-65; col. 14, lines 5-8).

As to claim 7, BRENNER teaches storing a representation of the resource allocation (via storing the resource max/min limits of each resource for each class to a share/tier profile storage device) (col. 5, lines 16-25; col. 5, lines 33-36; col. 8, lines 57-65; col. 14, lines 5-8). However, BHAGAT does not teach that the representation is in an XML format. Official Notice is taken in that XML is well-known data format and therefore would be obvious to one skilled in the art that the representation are stored in an XML format for retrieval.

As to claim 8, BRENNER teaches wherein the first resource pool (class) is associated with a first project (via the classification rules); and wherein the first process is one of a plurality of processes (processes) associated with the first project (via the processes using classification rules to identify the class the process belongs wherein the classes have resource amounts for indicating the amount of system resource shares the classes have) (col. 5, line 48 – col. 6, line 16).

As to claim 10, BRENNER teaches adjusting the resource allocation of resource pools (classes) during system execution (based on performance indication considering minimum and maximum amount of resource shares) (col. 7, line 64 – col. 8, line 15; col. 8, lines 38-65; col. 9, lines 18-24; col. 10, lines 10-

25). However, BRENNER does not explicitly indicate that the adjusting is performed dynamically. Official Notice is taken in that it is well known in the art that resource groups are adjusted dynamically and therefore would be obvious in view of the teachings of BRENNER that the classes are dynamically changed based on the performance indication that considers minimum and maximum amount of resource shares. For instance refer to U.S. Patent Application 2003/0028642, and U.S Patents 5,675,797 or 6,957,435.

As to claims 12, 13, 15, 17-19, and 21, reference is made to a computer readable storage medium that corresponds to the method of claims 1, 2, 4, 6-8 and 10 and is therefore met by the rejection of claims 1, 2, 4, 6-8 and 10 above.

As to claims 23, 24, 26,28-30, and 32, reference is made to a computer system that corresponds to the method of claims 1, 2, 4, 6-8 and 10 and is therefore met by the rejection of claims 1, 2, 4, 6-8 and 10 above.

Response to Arguments

3. Applicant's arguments filed October 16, 2006 have been fully considered but they are not persuasive. Applicant states that in contrast to the teachings of Brenner, the present invention provides logical separation between resource pools that can operate independently and separately from one another using separate scheduling techniques. For instance, a resource pool might use a time-sharing scheduler, a proportional share scheduler, and/or a real-time scheduler

wherein there is nothing in Brenner and Bean that would suggest assigning different scheduling techniques to resource pools. Applicant further states that there is no guarantee that the required resources will actually be available, since tasks must still contend for resources based on the number of shares assigned to the task. The examiner disagrees. First, the claim limitation, Applicant is referring to indicates the allocating of resources to **one or more** resource pools, including the first resource pool, to create a resource allocation, wherein requirements of the first resource pool are satisfied wherein the resources are assigned to the first resource pool **and wherein each resource pool can use a different scheduling technique.** The examiner is unable to ascertain how this limitation would means guaranteeing that required resources will actually be available such that real-time task are executed. Secondly, Applicant allows for only one resource pool, "one or more resource pools including the first resource pool" wherein each resource pool can use a different scheduling technique. If there is only one pool, then there is only one scheduling technique. In addition, the claims do not preclude the resource pools from having shares of different scheduling techniques. A limitation stating that each resource pool can use different scheduling techniques allows for the possibility that each resource pool has access to both scheduling techniques wherein one is currently running, or part of a scheduling technique wherein each part is different from the other. In addition, what is the definition of different in relation to the scheduling techniques; e.g. different instances of the same technique, different functionality of techniques; and different parts of the same technique. The use of the phrase

different scheduling technique does not only mean different algorithms. It could be a copy of the same algorithm or different parts of the same algorithm. Another reason why the examiner disagrees with the argument is that the claims do not **require** the resource pools to have different scheduling techniques. Applicant uses the term **"can"** which is not definitive of each resource pool having different scheduling techniques. For instance, machine code can be executed, but it is not required that when one discusses machine code that it is executing. The teachings of Brenner allows for resources to be allocated to a resource pool based upon its share. Brenner teaches that any type of system resource may be represented using the present invention including hardware and software resources (col. 6, lines 1-3). It is well known in the art that multiple types of scheduling algorithms are well known software resources and therefore obvious based on the teachings of Brenner that the scheduling algorithms **can** be allocated to resource pools since the teachings of Brenner includes all hardware and software resources. Therefore, the cited prior art of record and all well known teachings adequately teaches the claims limitations as disclosed.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory

action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lewis A. Bullock, Jr. whose telephone number is (571) 272-3759. The examiner can normally be reached on Monday-Friday, 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

December 29, 2006

LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER